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'A Constant Temperature Device:' by HAMILTON P. CADY. A device for keeping up the circulation of water at a constant temperature. 'The Equilibrium of Stereoisomers, II:' by WILDER D. BANCROFT. A study of the change from one isomer into another due to the addition of one or more components. Reviews of books and journals.

American Chemical Journal, May.—'A Determination of the Atomic Weight of Praseodymium and Neodymium:' by H. C. JONES. The material for this work was obtained from the Welsbach Light Co., and was carefully purified and tested with the Rowland spectroscope. The sesquioxide was converted into the sulphate and the calculation made from this. The values obtained were for the Praseodymium 140.45, and for the Neodymium 143.6. 'Veratrine and some of its derivatives:' by G. F. FRANKFORTER. A careful study of this substance and some of its derivatives has shown that it is identical with cevadine. 'On the action of Hydrogen Sulphide upon Vanadates:' by J. LOCKE. Several sulphovanadates have been prepared by the action of hydrogen sulphide on vanadates heated in a combustion furnace. 'On the formation of Imido-1, 2-diazol Derivatives from Aromatic Azimides and Esters of Acetylenecarboxylic-acids:' by A. MICHAEL, F. LUHEN and H. H. HIGBEE. 'On the Oxide of Dichlormethoxyquinonedibenzoyl-methylacetal:' by C. L. JACKSON and H. A. TORREY.

J. ELLIOTT GILPIN.

Appleton's Popular Science Monthly for May gives as a frontispiece a portrait of Professor Russell M. Chittenden, the eminent physiological chemist of Yale University, together with a sketch of his life and work. There is an elaborately illustrated article on 'Kite Flying in 1897,' by Mr. George J. Varney, based chiefly on the work of the Blue Hill Observatory. Dr. J. W. Spencer contributes an article on 'The West Indian Bridge between North and South America;' Dr. H. Carrington Bolton an article entitled 'A Relic of Astrology,' and Messrs. W. H. Beatley and G. H. Perkins an illustrated study of snow crystals. There are further two articles on the study of children and two on economic subjects.

McClure's Magazine for May devotes an article to John Milne, the author being Mr. Cleveland Moffett. There are numerous illustrations, including a portrait of Professor Milne, of his house at the Isle of Wight, and of seismographs and seismograms. Many details are given regarding the earthquake observatory and Professor Milne's experiences, put largely in the form of an interview.

SOCIETIES AND ACADEMIES.

ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA.

April 19. Mr. F. J. KEELEY exhibited microscopic preparations of jade from Mexico. The mineral resembles nephrite and is therefore merely a variety of serpentine.

Mr. H. A. PILSBRY described the radula of *Nerita peloronta*. It is over two inches long and is in extreme disproportion to the small snail bearing it. Types of rhipidoglossate and other radulæ were described. He regarded the radula of cephalopods not so much as a rasp as a help to swallowing food. In *Limnea* and other gastropods it certainly acts as a rasp. In *Bulla* and other Tectibranchs the structure of the gizzard makes rasping function of the radula comparatively unnecessary.

Mr. D. S. HOLMAN made a communication on the keeping of aquaria and described filaments of Spirochætæ an inch or so in length occurring in a pellicle on the surface of a tank partially shaded from the sun.

The PRESIDENT exhibited a pearl from a little neck clam. It is about $\frac{5}{8}$ of an inch in diameter, the shades of color resembling an eye, the optic nerve being suggested by a projection at the back. The inside of the shell was devoid of coloring matter.

April 26th. Dr. A. F. WITMER made a communication on the training of chronic epileptics, dwelling on the pathology of the disease and the advantages derived from fixing the attention by means of work on perforated embroidery cards with colored silks.

Dr. BENJAMIN SHARP spoke of rock carvings occurring on the west side of Kauai, one of the Sandwich Islands. The carvings are on rocks usually covered to a considerable height with beach sand and can only be seen when de-

nuded by peculiar conditions of wind and tide. A correspondent, Mr. F. K. Farley, had recently described such an exposure occurring on June 16th-21th of last year and had sent him illustrations of the carvings, which were exhibited. Mr. Farley describes such portions of the carvings, mostly crude linear representations of the human figure, as could then be seen, estimates the time required to make them and makes suggestions regarding their origin. The speaker, in continuation, presented philological evidence in support of the belief that Hawaii had been visited by Spaniards at an early date.

The distribution of *Fulgur perversum* on the New Jersey coast was commented on by Messrs. Woolman, Pilsbry and U. C. Smith.

May 3d. MR. GEORGE VAUX, JR., prefaced a communication on lead minerals by the remark that at a certain gathering of mineralogists a preponderance of votes was given in favor of regarding Vanadenite and Wolfenite as the most beautiful American minerals, although no one species received a majority of all the votes cast. He then exhibited and described a series of beautiful specimens of lead ores from his private collection and the William S. Vaux collection of the Academy, dwelling on the peculiarities of the examples displayed and giving the localities represented.

MR. JOSEPH WILCOX referred to carbonate of lead from Davidson Co., N. C., and related his unsuccessful effort to buy certain fine specimens from the original owners of the mine, who declined parting with them on the ground that they were all they had secured in return for their investment. Except in the case of mica and corundum, and possibly a little gold, he believed none of the mines of the State had paid their owners.

MR. LEWIS WOOLMAN described and illustrated, by means of microscopic preparations, a number of forms of fossil foraminifera, dwelling on their characters, classification and distribution. Referring to the distribution of fossil *Fulgur perversum* on the New Jersey coast he quoted from Captain Swain, of the Avalon Life Saving Station, that they were found on the beach during a strong northeast wind immediately following a northeast gale.

MR. F. J. KEELEY exhibited under micro-

scopes and commented on a series of specimens illustrating the mode in which organisms are preserved in fossil form. The exhibit included fossil wood, coal, jet, limestone containing shells, a larva in amber, structure of tooth of *Oreodon* and bone of *Iguanodon*, diatoms from Japan, coral, etc.

Papers under the following titles were presented for publication: 'Materials toward a natural classification of the Cylindrelloid Snails,' by Henry A. Pilsbry and E. G. Vanatta; 'Notes on Mr. Meehan's paper on the Plants of Lewis and Clark's Expedition across the Continent, 1804-06,' by Dr. Elliot Coues; 'List of Bats collected by Dr. W. S. Abbott in Siam,' by Gerrit S. Miller, jr.

A paper on the vertebrate remains of the Port Kennedy Bone Cave, by the late Professor Edw. D. Cope, was accepted for publication in the *Journal*. Papers on the summer birds of Central California, by John Van Denburgh, and a revision of the North American slugs, by Henry A. Pilsbry and E. G. Vanatta, will be printed in the *Proceedings*.

EDWARD J. NOLAN,
Secretary.

BOSTON SOCIETY OF NATURAL HISTORY.

THE Society met April 6th; fifty-seven persons present.

Dr. C. B. Davenport read a paper, 'A precise criterion of species; its applicability to systematic zoology,' and Mr. J. W. Blankinship followed with a paper on 'A precise criterion of species; its application to systematic botany.' These papers will be published in an early number of SCIENCE.

Professor E. S. Morse considered that success in determining the true relations of species would be attained from methods similar to those of Dr. Davenport and Mr. Blankinship. He discussed at length the characteristics of certain land and marine shells of New England and Japan.

Dr. B. L. Robinson said that nutrition in plants was of great importance and rendered measurements of doubtful value; maturity was also of great importance and promiscuous variability should always be taken into account.

Mr. C. J. Maynard said that newer forms

were more plastic than those that had been longer established; he mentioned several cases among shells and birds that could with difficulty be considered by mathematical tests.

Dr. R. T. Jackson alluded to cases among shells showing a radical difference in the right and left sides and to radial variations showing differentiation in a single individual.

Professor Alpheus Hyatt considered that in the papers of Dr. Davenport and Mr. Blankinship opinion was largely replaced by a definite, exact method which should be thoroughly tested. Its applicability would seem confined to characters that can be measured. He doubted if the color characters of the *Achatinellinae* could be expressed in numbers.

SAMUEL HENSHAW,
Secretary.

NEW YORK ACADEMY OF SCIENCES—SECTION
OF GEOLOGY AND MINERALOGY,
APRIL 18, 1898.

THE first paper of the evening was by Dr. A. A. Julien on the 'Elements of Strength and Weakness in Building Stones.' Dr. Julien called attention to the fact that in the testing of building stones little consideration is given to the causes influencing their various properties. In judging the resistance which a stone shows towards weathering, care should be taken to recognize the character of the forces to which it has been subjected. The strength of a stone bears no relation to its mineral components, but is dependent on the shape and arrangement of the mineral grains and the character of the cementing material. In considering the strength of a stone four facts have to be kept in mind, viz: interlockment of the particles; coherence, dependent on character of the cement and adhesion of the grains; rigidity; and tension.

The 'quarry sap' he believes, plays a more important rôle than has hitherto been recognized, as it probably carries much of the cement in solution and deposits it only when the stone is exposed to the air. This accounts for the hardening of the stones after being quarried. A distinction should also be made between porosity due to cavities between the grains and interstices in the individual minerals. The former is a source of weakness, the latter not, although

either may cause the rock to exhibit a high absorptive capacity.

All these points, which have important bearing on the strength of building stones, are best studied with the microscope. The paper was illustrated by means of sections thrown on the screen with a polarizing lantern. Discussion was by Professor Kemp and Mrs. Dudley.

The second paper of the evening was by J. D. Irving on 'Contact-metamorphism of the Palisades Diabase.' Mr. Irving referred to the work done by Professors Osann and Andrae some years ago and stated that his results agreed with theirs, but recent railroad excavations at Shadyside had enabled him to obtain additional facts. The diabase flow becomes denser, finer grained and porphyritic towards the contact with a decrease in hypersthene. It is also conformable to the Newark shales. In addition to the zones found by Osann, Mr. Irving found: 1. A normal hornfels zone rich in spinel; 2. a hornfels zone with brown basaltic hornblende layers; 3. hornfels with an undeterminable isotropic mineral resembling leucite; 4. hornfels with andalusite becoming more arkose farther from the contact. The diabase is to be considered as an intruded mass and not a surface flow. The paper was discussed by Professors Kemp and Dodge, and Dr. Hovey and Mr. White.

HEINRICH RIES,
Secretary of Section.

CHEMICAL SOCIETY OF WASHINGTON.

THE regular monthly meeting was held on March 10, 1898.

Dr. E. A. de Schweinitz presented a paper on 'The Pasteur Milk Laboratory of Washington.' The speaker first reviewed briefly some of the ways in which milk can become infected, either from the fact that the animals are dirty and the stables in a filthy condition, or from the carelessness of the milkers, the dirty condition of the pans and pails and the use of impure water for washing these utensils. Attention was also called to the fact that dogs, cats, rats, mice, etc., which often obtain access to the place where the milk is ordinarily kept in the country, may affect the milk, as it is well known that these animals are often carriers of disease. In view of all these well known dangers, and es-

pecially the fact that many outbreaks of typhoid fever have been traced directly to an impure milk supply, the Medical Society of the District of Columbia has endeavored to introduce a good milk by appointing a committee that should supervise a dairy and laboratory which was to be conducted on thoroughly hygienic principles. Such a dairy has been established and all possible precautions are observed. The milk is obtained from healthy tuberculin-tested cattle. These are kept in a well-ventilated, clean stable with a cement floor. Before milking the animals are carefully cleaned and curried, and taken into a smaller building designed for a milking room and kept as far as possible free from dust. The milk is immediately passed through a separator and cooled to about 45° . It is then brought to the bottling laboratory in cans, when it is placed in thoroughly clean sterilized bottles, which are sealed with paraffined paper caps. This milk is called sanitary milk, to distinguish it from other milk which is still further improved by pasteurization. Ordinary milk may contain from 60,000 to two or three millions of bacteria per cc., whilst by the above method a milk has been obtained which contained only from 1,200 to 3,000 bacteria per cc.

Dr. Hillebrand read a paper on 'The Colorimetric Estimation of Small Amounts of Chromium with Special Reference to Rocks and Minerals.' The time required for the separation of chromium from certain other constituents which have likewise to be determined in rock and ore analysis is very considerable; the amounts in question are often extremely small, and the separations are, therefore, more or less imperfect; hence, a rapid and accurate method for these small amounts is very much needed, and seems to be fully afforded by a comparison of the color of an alkaline solution of the chromium as chromate with a similar solution containing a known amount of chromium. The method was thoroughly tested with prepared chromium solutions whose contents ranged in amounts from 1 mg. to 7.5 mg. counted as Cr_2O_3 , in varying dilution, though the figures given by no means represent the limits of the method. The standards employed contained K_2CrO_4 , corresponding to .1 and .2 mg. per cc., respectively, of Cr_2O_3 , and in mak-

ing the determinations were always diluted to agree with the purposely made weaker test solutions. The maximum and minimum deviations from the truth were +.32 mg. and -.26 mg.; the average error being a little less than +.02 mg.

The method was given a severe practical test by adding to several grammes of an iron ore, and also to a silicate, known amounts of chromium and subjecting the mixture to fusion with sodium carbonate and potassium nitrate, precipitating P_2O_5 , V_2O_5 and CrO_3 from the aqueous extract with mercurous nitrate, igniting the precipitate, fusing the residue with sodium carbonate and thus obtaining a small bulk of highly colored solution. The results were equal to those of the preliminary tests and show the method to be highly accurate for small and moderate amounts of chromium. When there is enough chromium in a sample to give a sufficiently colored extract of the first alkali fusion the color comparison may be made at once with this solution and thus much time may be saved. Manganese, however, must be thoroughly removed, most quickly by reduction with methyl alcohol. The glasses used by the author were shown and the simple precautions for securing proper illumination were described. For amounts less than .1 mg. it is best to use Nessler tubes.

Mr. Tassin exhibited specimens of products obtained in Moissan's electric furnace consisting of carbides of aluminum, boron, iron, cobalt, cerium and calcium, the elements molybdenum, uranium, tungsten, titanium and chromium and a piece of iron containing a diamond. The high temperature which it is possible to obtain with this furnace was illustrated by a specimen of fused lime.

Dr. Bolton presented a postscript to his paper on 'Early American Chemical Societies,' which he read at the meeting held on April 8, 1897. He called attention to a club of German chemists which was organized in New York in the winter of 1863-64. The president of the club was Dr. Friedrich Hoffman and prominent among its members were Ferdinand F. Meyer, M. Alsberg and Isidore Walz.

WILLIAM H. KRUG,
Secretary.